

# PATENT ABSTRACTS OF JAPAN

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(54) **DEVICE FOR DECREASING BODY FAT**

(57)Abstract:

**PROBLEM TO BE SOLVED:** To surely decompose and decrease local body fat without exercises by burning FFA generated from local steatolysis by way of ultrasonic irradiation to mammal, and by making the FFA consumed in an electric muscle-stimulating device the main part of FFA of the local steatolysis.

**SOLUTION:** The local body fat is decomposed by ultrasonic irradiation and the FFA generated locally is burnt and consumed by electric muscle stimulus. The effect improves by taking both calorigenic agents and calorigenic auxiliary agents.

## CLAIMS

[**Claim 1**] A fat reduction method using together lipolysis by ultrasonic irradiation, and consumption of lipolysis output of an electric muscular stimulus to the mammals, and its device.

[**Claim 2**] An ultrasonic irradiation apparatus or electric muscular stimulator, wherein concomitant use of Claim 1 applies others during one of application, simultaneous, or remains of the effective effect.

[**Claim 3**] A fat decreasing device, wherein an ultrasonic irradiation applicator and an electric muscular stimulating electrode are made into one in Claim 1.

[**Claim 4**] A fat decreasing device, wherein a skin surface contact portion of an ultrasound applicator serves as an electric muscular stimulating electrode in Claim 1.

[**Claim 5**] A fat reduction method applying further electric muscular either ultrasonic irradiation or stimulus at least in Claim 1 during a heat production agent and the heat production auxiliary agent (carnitine etc.) administration effect shelf-lives (KAPUSAIN etc.), or being able to creep, and prescribing a heat production agent for the patient during that application effect duration,

and its device.

### **Detailed Description of the Invention**

[0001]

**[Field of the Invention]** It belongs to the field which cancels mammalian obesity, and mechanical and it is concerned with an electric-stimulus device.

[0002]

**[Description of the Prior Art]** This invention persons indicated that irradiated PCT international application public presentation WO99/39677 with the ultrasonic wave of specific frequency and intensity, a fat decomposed, and free fatty acid carried out. It was checked that free fatty acid (FFA) in blood carries out abbreviation redoubling of this by the exposure for about 10 minutes to a rat by subsequent supplementary examination and that ultrasonic irradiation stimulates the sympathetic nerve of an irradiated part, and norepinephrine (NE) which is lipolysis hormone doubles too. It is presumed that NE occurs the lipolysis of fat cells and emits FFA and glycerol into blood.

[0003]As compared with the left thigh of not being irradiated with the skinfold thickness of an irradiation part part, and abdomen \*\*\*\*, reduction is checked about 12 to 18% by the ultrasonic irradiation for 10 minutes a room/[ a day and ] and ten days of the Homo sapiens right femoral region and abdomen \*\*\*\*. Although this carried out about 60-kcal movement after glaring for FFA combustion, Homo sapiens who does not exercise in part also showed 20% of reduction. Since it is the about 2000 quantity of motion Kcal(s) on the 1st, 60-kcal meaning is not clear.

[0004]On the other hand, Siemens indicated electric muscular stimulator and it has put stereo die NETA SD-828 on the market as goods. This aims at acquiring the same effect to have made muscles exercise by sending about 15-kHz current through muscles from the electrode contacted for the body surface, occurring muscular contraction in this stimulus, and repeating this. 20-50 mA is applied for abbreviation 30 to 40 minutes. The rise of about 4 \*\* of body surface temperature and continuation of about 1 hour are observed.

[0005]Movement of prolonged muscles consumes sugar in blood from the ingestion first, and starts consumption of the fatty acid in blood which disassembles the fat of the source of energy stockpiling soon. The demand of the energy source supply in blood reaches a brain, generation instructions of lipolysis hormone are taken out from hypothalamus, and this is considered that a fat decomposes by fat cells and the result of the generation of FFA is carried out. It is not clear whether this lipolysis arises near the muscular movement part or it produces systemic.

[0006]

**[Problem(s) to be Solved by the Invention]** the method which burns certainly FFA in generating blood in ultrasonic irradiation -- a method which burns without requiring desirable Homo sapiens, movement laborious for an animal, etc. is desired. On the other hand, it is necessary to secure local lipolysis clearly by electric muscle stimulus.

[0007]

**[Means for Solving the Problem]** Means 1: A fat reduction method using together lipolysis by ultrasonic irradiation and consumption of lipolysis output of an electric muscular stimulus to the

mammals and its device are used.

[0008]Means 2: An ultrasonic irradiation apparatus or electric muscular stimulator, wherein concomitant use of the means 1 applies others during one of application, simultaneous, or remains of the effective effect is used.

[0009]Means 3: A fat decreasing device, wherein an ultrasonic irradiation applicator and an electric muscular stimulating electrode are made into one in the means 1 is used.

[0010]Means 4: A fat decreasing device, wherein a skin surface contact portion of an ultrasound applicator serves as an electric muscular stimulating electrode in the means 1 is used.

[0011]Means 5: In the means 1, during the administration effect shelf-life of heat production agents (KAPUSAIN etc.) and heat production auxiliary agents (carnitine etc.), at least further Ultrasonic irradiation, A fat reduction method applying either of the electric muscular stimuli, or being able to creep, and prescribing a heat production agent for the patient during that application effect duration, and its device are used.

[0012]

**[Embodiment of the Invention]** Mode 1: Use together ultrasonic irradiation apparatus and electric muscular stimulator by the means 1. Ultrasonic irradiation generates FFA in blood first. This is already generated in the exposure for about 10 minutes. Subsequently, if electric muscular stimulator is used together, generating FFA will be simultaneously consumed with existing food intake sugar. Therefore, it is not necessary to apply electric muscular stimulator for a long time, and to wait for the lipolysis after consumption of food intake sugar probably, and fat reduction is obtained for a short time.

[0013]Mode 2: As shown in the means 2, an ultrasonic wave and electrical stimulation may be applied simultaneously. Although consumption of food intake sugar and generating of FFA take place simultaneously, the FFA consumption by existence of FFA and electric muscular stimulus should just exist simultaneously. all of the state are remarkable -- since time continuation is carried out -- a mutual time gap -- looseness \*\*\*\*. That is, since other shelf-lives should just fall on each shelf-life, it may get mixed up mutually.

[0014]Mode 3: An ultrasonic irradiation machine and an electric muscular stimulus machine may be separate respectively, and each applicator may be used as the same body as shown in the means 3. In this case, handling is convenient. The large applicator who did the multiple arrays of the unit transducers, such as a piezoelectric ceramic, for irradiating with a mammalian abdomen etc. as widely as possible is desirable. The electrical stimulation electrode of a number can be suitably prepared for this applicator.

[0015]Mode 4: As shown in the means 4 again, the ultrasonic irradiation applicator surface may serve as the electrode of an electrical stimulation machine. This makes the surface of an ultrasound applicator a thin conductive layer with little ultrasonic absorption, and should just give this the muscle stimulus electrical and electric equipment. the precious metals with few skin contact obstacles in construction material, carbon, etc. -- \*\*\*\* -- better -- \*\*. Ultrasonic jelly is also good to make an organic nature conductive component contain. Muscle stimulus current is about 20-50 mA, and so much [ an electrode and jelly ] electrical conductivity is unnecessary.

[0016]Mode 5: The exposure machine which compounds an obesity dissolution agent and

ultrasonic irradiation is indicated by above-mentioned PCT application. Concomitant use of a heat production auxiliary agent like the carnitine which carries FFA to the mitochondrion in the muscle cells which change into energy using a heat production agent like the capsaicin which burns FFA by an obesity dissolution agent, especially administration similarly by this patent, and FFA, and it is eventually considered as heat, i.e., burn increases an effect. proper after administration -- time progress is carried out, it is absorbed and the effect appears. While this effect is continuing, it is good to carry out the means 1.

[0017]

**Effect of the Invention** According to this invention, it is carried out by generating of FFA by decomposition of the fat cells near NE discharge of an irradiation part cohering by ultrasonic irradiation in shift among blood, and consumption combustion of FFA in blood by electric muscular stimulus, and a fat can be decreased, without especially the mammals exercising. It is realizable, skinfold thickness reduction, i.e., local \*\*\*\*, of a mammalian living body part.